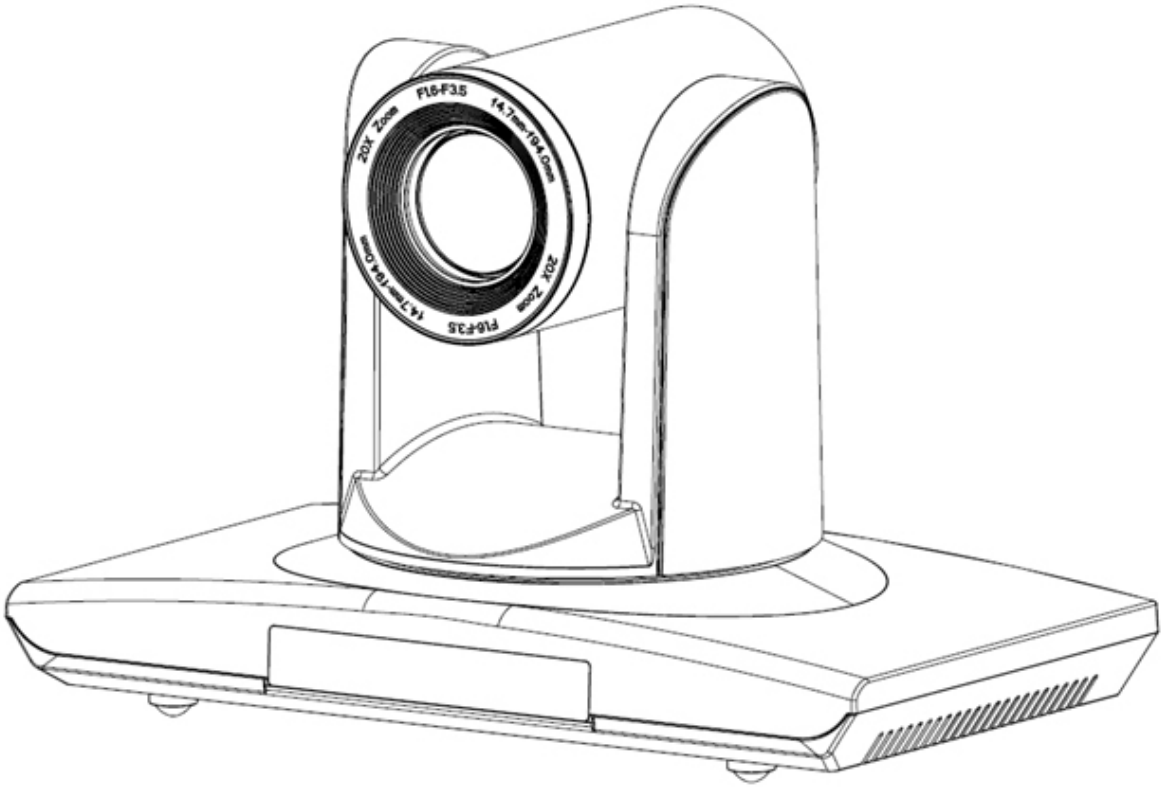
Minrray UV850
HD Color Video Camera
User Manual



（English）

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Preface:

Thanks for using our HD color video conference camera .

This manual introduces the function installation and operation of the HD camera . Prior to installation and usage , please read the manual thoroughly .

Warning

This product can be only used in specified range in order to avoid any damage or danger;

Don’t expose the camera to rain or moisture place

Don’t remove the cover to reduce the risk of electric shock. Refer servicing to qualified personnel .

Never operate the camera under unqualified temperature , humidity and power supply;

Only use the replacement parts recommended by us.

Please use the soft cloth to clean the camera. Use neuter cleanser if bad smeared .No uses the strong or cleanser avoiding scuffing.

Be careful or moving; never press the drive parts heavily avoiding camera trouble.

Notes

Electromagnetic fields at the specific frequency may affect the image quality.

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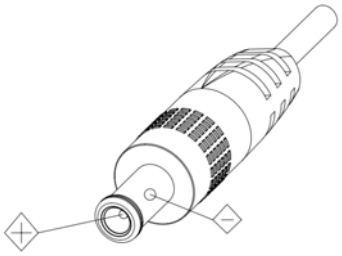
Notes

Electric Safety
Installation and operation must accord with electric safety standard
Caution to transport
Avoid stress, vibration and soakage in transport , storage and installation .
Polarity of power supply
The power supply of the product is +12V, the max electrical current is 2A .polarity of the power supply drawing.



Careful of installation
Never move the camera by seizing the camera head . Don't rotate camera head by hand, otherwise, mechanical trouble will occur.
This series item must put on the smooth desk or platform , and it can not be installed slantways ;
If the camera is installed on TV or computer , the base can be fixed by three double-sided adhesive tray.
Don't apply in corrosive liquid , gas or solid environment to avoid the cover which is made up of organic material .
To make sure no obstacle in rotation range
Never power on before installation is not completed

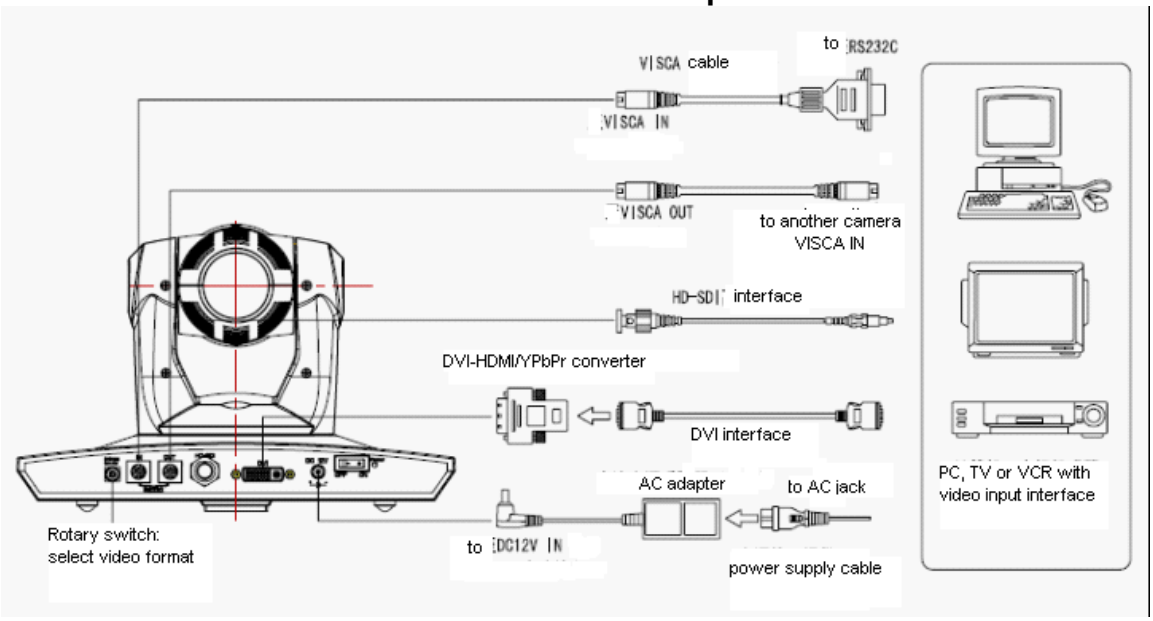
Don't dispatch discretionarily.
We are not responsible for any unauthorized modification or dismantling .

Supplied Accessories

When you unpack , check that all the supplied accessories are included :
Camera ……1
Power adapter ……1
Power cable……1
RS232 cable……1
Remote controller……1
User manual ……1
Double-side glue shim ……4

Fast Installation

1. Please check the connection before turn on the power .

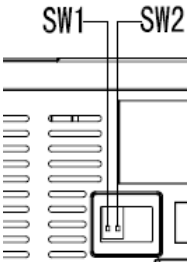


2. Bottom Dial Switch Setting

Set Two DIP switch “OFF”,it is the Working Mode.

Setting and instruction bottom dial switch :

	SW-1	SW-2	Modes
1	OFF	OFF	Working mode
2	ON	OFF	Updating Mode
3	OFF	ON	Debugging Mode
4	ON	ON	NONE



3、The Rotary Switch Setting

Sixteen Rotary Switch setting for format setting selections:

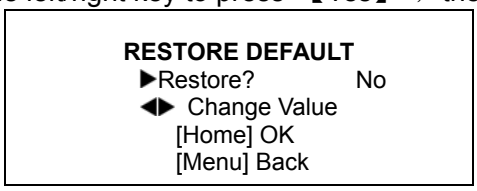
Index			
0	1080P60		
1	1080P50		
2	1080I60		
3	1080I50		
4	720P60		
5	720P50		
6	1080P30		
7	1080P25		
8	720P30		
9	720P25		
A	1080P59.94		
B	1080I59.94		
C	720P59.94		
D	1080P29.97		
E	720P29.97		
F	None		

Note: Please restart the camera after shift the video format

4, When Power supply switch is “on” ,the indicator light is open(red color)

5, Camera initializes after 5 seconds: Rotate to the right limit, move to the down limit; Then turn left, motor stops when horizontal and vertical rotation is in the middle, camera lens will move to the wide angel position. Initialization finishes . (**Note** : the camera will move to the preset position no.0 if set)

6, Restore default setting: enter into the OSD menu by press the menu key of remote controller, select 【Restore Default】, moving the left/right key to press 【Yes】 ， then confirm by 【HOME】key .



Camera highlights

1、Adopts integrated 72.5°wide view angle lens，12 X optical zoom

2、provides low illumination solution, particularly suitable for occasion in the general lighting.

3、Reaches 1920×1080 pixel , the max video frame is 60/50 FPS . It definitely meets the requirement for both high clarity and smooth picture .

4、video’s S/N ratio directly affects the HD video conference terminal’s image compression coding efficiency. With 2D and motion-estimation based 3D noise reduction algorithm and U.S new generation low noise sensor, the camera has effectively reduced noise;

5、The unique Iridix exposure dynamic control algorithm, based on the human eye mode, makes the image even exposure and strong sense of hierarchy; With the most advanced CMOS sensor which support WDR ,the camera can capture all images clearly in the strong contrast between black and light environment(such as backlight);

6、supports DVI-I(can convert to YPbPr and HDMI output) interface , broadcast level HD-SDI interface .

7、 IR remote controller signal transparent transmission function : the camera can receive signal from both its own remote controller and terminal equipment controller, by transmitting the signal through VISCA IN to terminal equipment IR receiver.

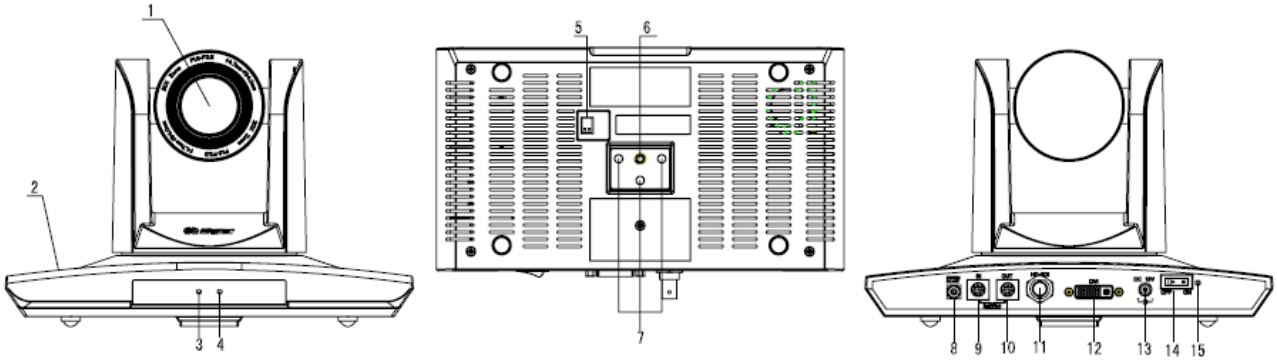
Camera Specifications

Model	the camera -S	the camera-M	the camera-C
Video Format	1080p/60, 1080p/59.94, 1080p/50, 1080p/30, 1080p/29.97, 1080p/25, 1080i/60, 1080i/59.94, 1080i/50, 720p/60, 720p/59.94, 720p/50, 720p/30, 720p/29.97, 720p/25	1080p/30, 1080p/29.97, 1080p/25, 1080i/60, 1080i/59.94, 1080i/50, 720p/60, 720p/59.94, 720p/50, 720p/30, 720p/29.97, 720p/25	720p/60, 720p/59.94, 720p/50, 720p/30, 720p/29.97, 720p/25

Output Interface	DVI-I(HDMI、YPbPr)、HD-SDI（optional）	Tilt Rotation speed	1.7° ~ 69.9°/s
Image Sensor	CMOS、1/3 inch	Up/down Installation	Support
Image Sensor Pixel	Pixel：274million，Effective pixel：207million	Preset No.	128
Zoom	12x, f3.5mm ~ 42.3mm, F1.8 ~ F2.8	Preset	≤0.2°
Focus	Auto、Manual	Control Interface	8pin Mini DIN
Shutter Speed	1/25s ~ 1/10000s	Protocol	VISCA、Pelco-D、Pelco-P
White Balance	Auto、Indoor、Outdoor、Manual	WDR	≥100dB
B/L Compensation	Support	Power Supply Adapter	DC12V/1.5A
S/N Ratio	≥55dB	Power Consumption	12W

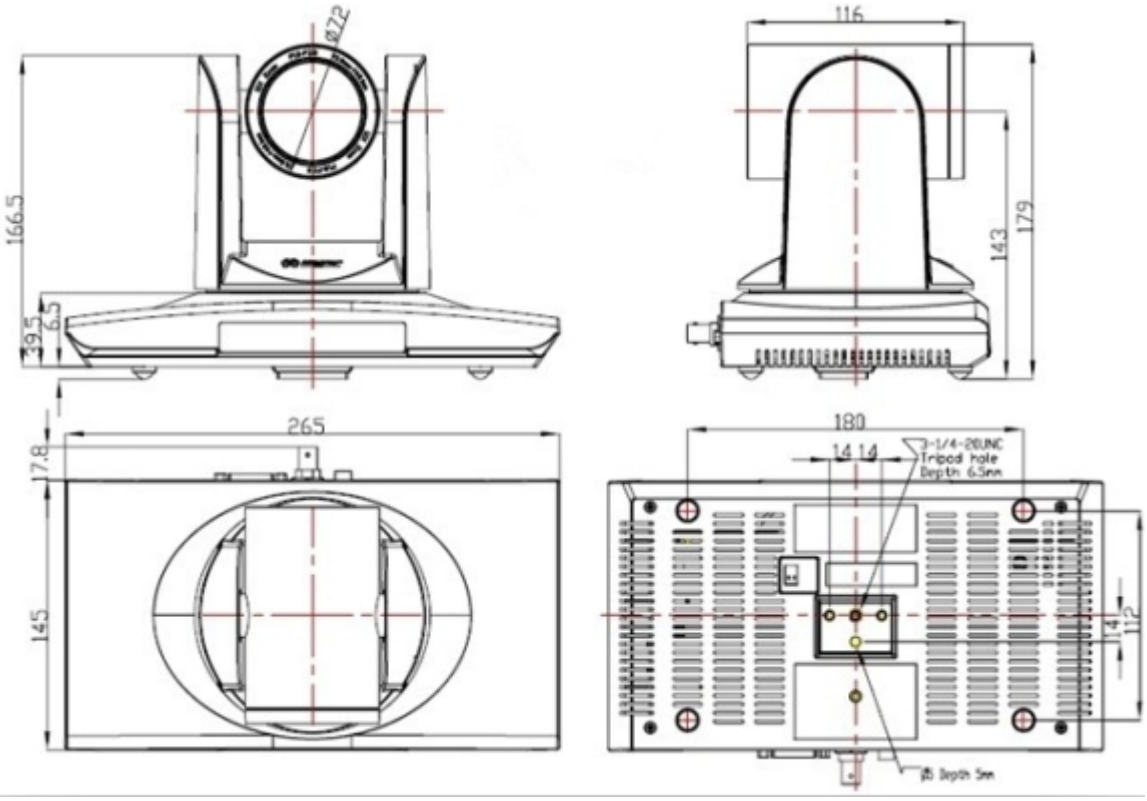
Pan Control Speed	72.5° ~ 6.9°/sec	Dimension	265mmX145mmX179mm
Tilt Control Speed	44.8° ~ 3.9°/sec	Color	Silver&Black
Pan Rotation	±170°	Weight	2.0Kg
Tilt Rotation	-30° ~ +90°	Working Temperature	0℃to+45℃
Pan Rotation Speed	1.7° ~ 100°/s	Storage Temperature	-10℃ to +60℃

Camera Interface Explanation

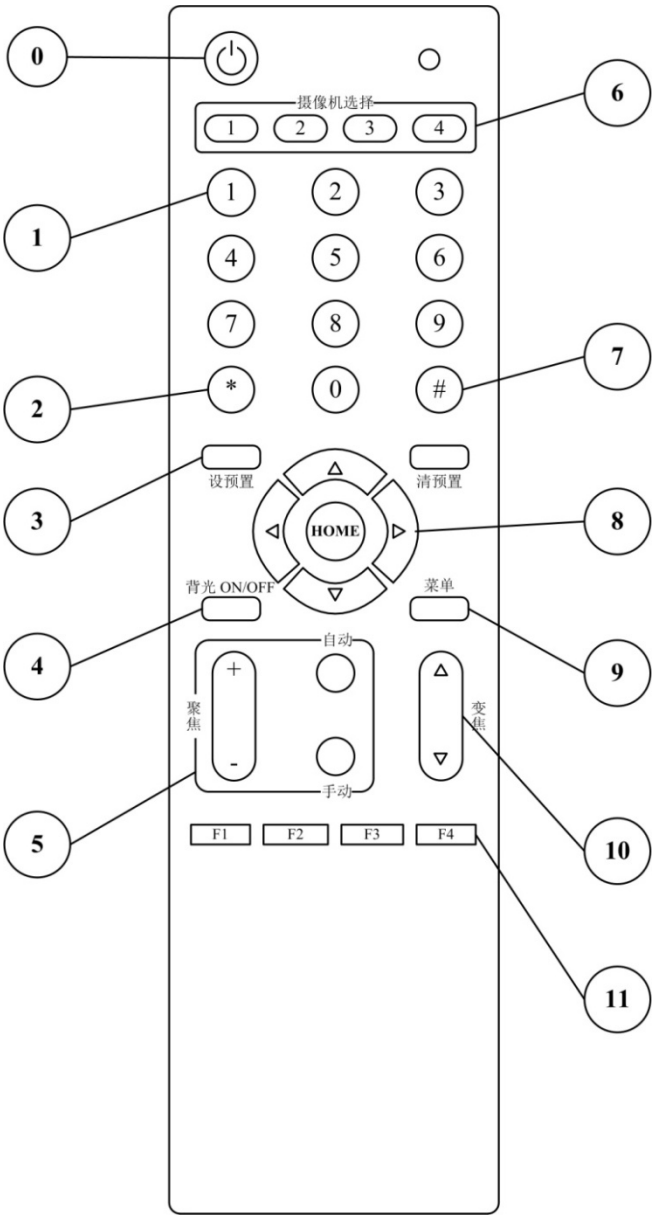


1.Camera lens 2.IR Receiver 3.Power indicator light (red)
4.Standby indicator light 5.Bottom dial Switch 6.Tripod screw hole
7.Installation Orientation Hole 8.Rotary Switch : video format optional
9.RS232 controller serial interface (input) 10.RS232 controller serial interface (output)
11.HD-SDI interface （optional） 12.DVI-I interface 13.DC12V Input Power Supply Jack
14.Power Switch 15.Power indicator light(red)

Appearance Dimension



Remote Controller



0、Standby key

After pressing the standby key, the camera will step into standby mode.Press again,the camera will open again.(Note: Standby mode power consumption is about half of the normal mode)

(Note: Standby mode power consumption is about half of the normal mode)

1、Number key

Setting or locating presets

2、* key

Key combination use

3、Set preset key:

Set preset：

Set preset key + 0-9 number key：

Clear preset key：

Clear preset key + 0-9 number key

or：＃+＃+＃：clear all the presets

4、BLC control key

BLC ON：open black light compensation（only work when exposure mode setting is Auto）

BLC OFF：close black light compensation（Only available in the exposure mode effective for Auto）

5、Focus control key

Focus＋：focus length far from near

Focus－：focus length near from far

Auto focus：the camera focus mode is auto

Manual focus：the camera focus mode is manual

6、Camera address selection

Select the camera which want to be controlled

7、 # key

Key combination use

8、pan/tilt control key

Press ▲key ： up

Press ▼key ： down

Press ◀key ： left

Press ▼key：right

“HOME” key: Return to the middle position

9、Menu setting

Open or close the OSD menu

10、Zoom Control key

zoom＋：lens near

zoom－：lens far

11.controlling camera address selection

【*】+【＃】+【F1】：Camera Address No.1

【*】+【＃】+【F2】：Camera Address No. 2

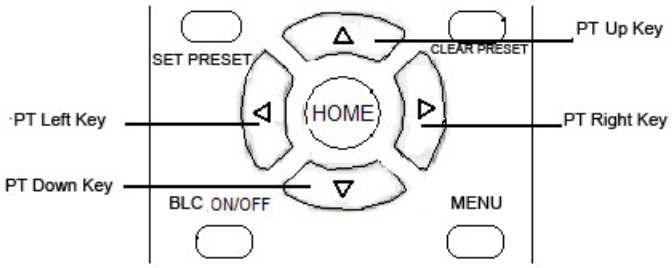
【*】+【＃】+【F3】：Camera Address No. 3

【*】+【＃】+【F4】：Camera Address No. 4

Usage of IR Remote Controller

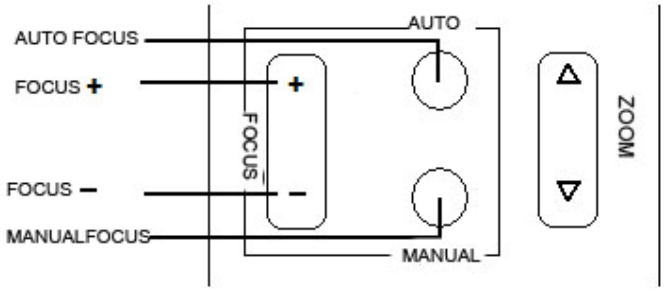
Starting normally, the camera can receive and execute the IR commands. It can set or run preset positions, and rotate via the IR remote controller.
Key Instruction：
1、In this instruction, “press the key” means a click rather than a long-press, and a special note will be given if a long-press for more than one second is required.
2、When a key-combination is required, do it in sequence. For example, “【*】+【#】+【F1】”means press“【*】”first and then press“【#】” and press“【F1】”at last.

1.Pan/Tilt Control



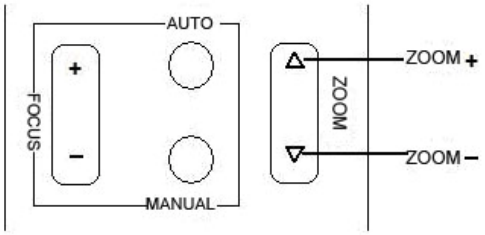
Up: press ◀
Down: press ▲
Left: press ▼
Right: press ◀
Back to middle position：press“【HOME】”
Press and hold the up/down/left/right key, the pan/tilt will keep running, from slow to fast, until it run to the endpoint; The pan/tilt running stops as soon as the key is released.

2. Focus Control



Focus (far)： Press ”【focus+】” key
Focus (near)： Press “【focus-】“key
Press and hold the key, the action of focus continues and stops as soon as the key is released.

3.Zoom Control

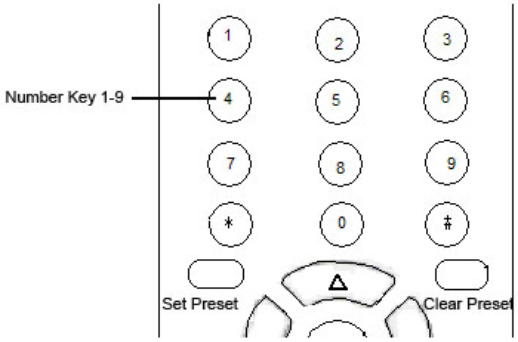


ZOOM OUT: press “ZOOM ▼“ key
ZOOM IN: press “ZOOM ◀” key
Press and hold the key, the camera will keep zooming in or zooming out and stops as soon as the key is released.
AUTO: auto focus
MANUAL: manual focus

4.BLC Setting

BLC ON / OFF: open or turn off the BLC(only available in the auto mode)

5. Presets setting



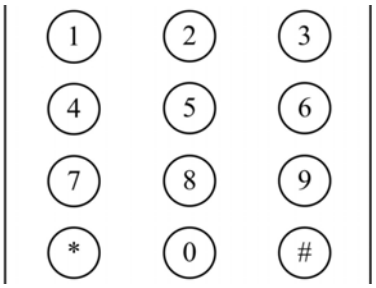
1.Preset setting : to set a preset position, the users should press the "【SET PRESET】" key first and then press the number key 0-9 to set a relative preset.

10 preset positions in total are available via the remote controller.

2.Preset clearing : to clear a preset position, the user can press the "【CLEAR PRESET】" key first and then press the number key 0-9 to clear the relative preset;

Note : press the"【#】" key three times continually to cancel all the presets.

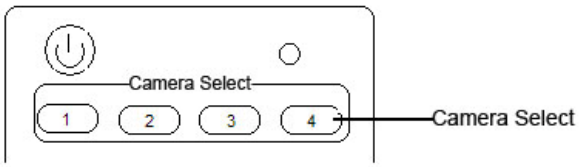
6.Preset Running



Press a number key 0-9 directly to run a relative preset.

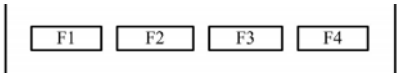
Note: Action in vain if a relative preset position is not existed.

7.Camera Selection



Select the camera address to control.

8.Camera Remote Controller Address Setting



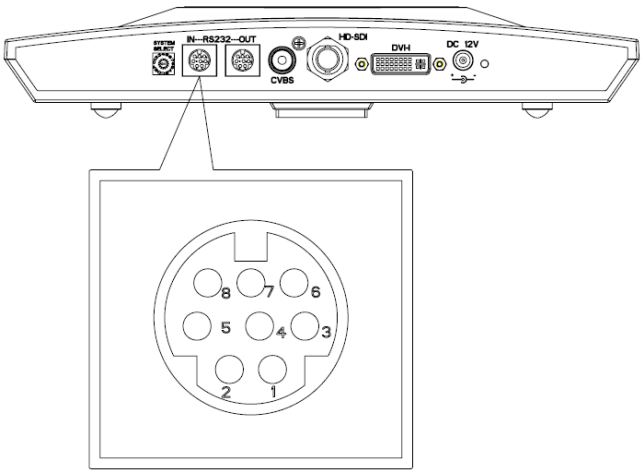
【*】+【＃】+【F1】: Camera Address No.1

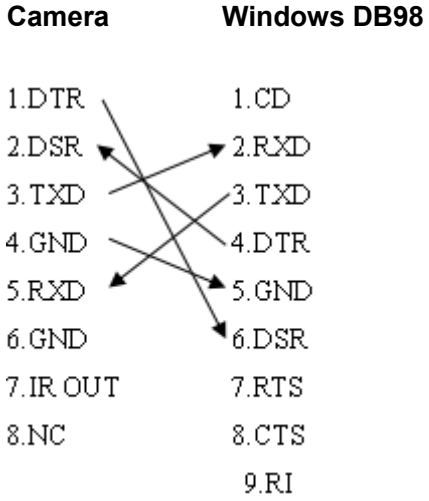
【*】+【＃】+【F2】: Camera Address No. 2

【*】+【＃】+【F3】: Camera Address No. 3

【*】+【＃】+【F4】: Camera Address No. 4

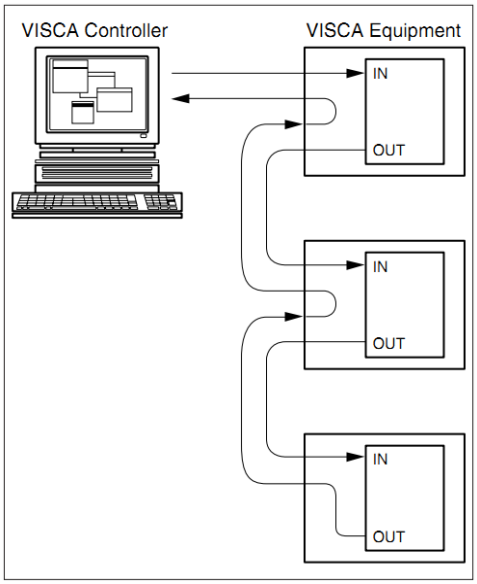
RS-232C Interface (Pin Specs)





No.	Function
1	DTR
2	DSR
3	TXD
4	GND
5	RXD
6	GND
7	IR OUT
8	NC

VISCA OUT Function



COM control

In the normal working condition, the camera can connect a VISCA or Pelco-P or Pelco-D equipment via the control of RS232 IN. The parameter of the RS232C COM is as following:
Baud Rate：2400/4800/9600 Bit/S
Start bit: 1bit ;
Data bit: 8bit ;
Stop bit : 1bit;
Code: None
Powering on, the camera runs to the up right, then back to the middle with the farthest zoom rate in the auto focus and the iris default value. Finishing the initialization, the camera moves to the preset no.0 if it's saved. Now, the camera can be controlled by the serial command.

VISCA Protocol

Part1 Camera Return Command

Ack/Completion Message		
	Command Packet	**Note**
ACK	z0 41 FF	Returned when the command is accepted.
Completion	z0 51 FF	Returned when the command has been executed.

z = Camera Address + 8

Error Messages		
	Command Packet	**Note**
Syntax Error	z0 60 02 FF	Returned when the command format is different or when a command with illegal command parameters is accepted
Command Not Executable	z0 61 41 FF	Returned when a command cannot be executed due to current conditions. For example, when commands controlling the focus manually are received during auto focus.

Part 2 Controlling Command

Command	Function	Command Packet	Note
AddressSet	Broadcast	88 30 01 FF	Address setting
IF_Clear	Broadcast	88 01 00 01 FF	I/F Clear
CommandCancel		8x 21 FF	
CAM_Power	On	8x 01 04 00 02 FF	Power ON/OFF
	Off	8x 01 04 00 03 FF	
CAM_Zoom	Stop	8x 01 04 07 00 FF	
	Tele(Standard)	8x 01 04 07 02 FF	
	Wide(Standard)	8x 01 04 07 03 FF	
	Tele(Variable)	8x 01 04 07 2p FF	p = 0(low) - 7(high)
	Wide(Variable)	8x 01 04 07 3p FF	
	Direct	8x 01 04 47 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_Focus	Stop	8x 01 04 08 00 FF	
	Far(Standard)	8x 01 04 08 02 FF	
	Near(Standard)	8x 01 04 08 03 FF	
	Far(Variable)	8x 01 04 08 2p FF	p = 0(low) - 7(high)
	Near(Variable)	8x 01 04 08 3p FF	
	Direct	8x 01 04 48 0p 0q 0r 0s FF	pqrs: Focus Position
	Auto Focus	8x 01 04 38 02 FF	AF ON/OFF
	Manual Focus	8x 01 04 38 03 FF	

Command	Function	Command Packet	Note
	Auto/Manual	8x 01 04 38 10 FF	
CAM_ZoomFocus	Direct	8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF	pqrs: Zoom Position tuvw: Focus Position
CAM_WB	Auto	8x 01 04 35 00 FF	Normal Auto
	Indoor mode	8x 01 04 35 01 FF	Indoor mode
	Outdoor mode	8x 01 04 35 02 FF	Outdoor mode
	OnePush mode	8x 01 04 35 03 FF	One Push WB mode
	Manual	8x 01 04 35 05 FF	Manual Control mode
	Temperature mode	8x 01 04 35 2p FF	p:Color Temperature
CAM_RGain	Reset	8x 01 04 03 00 FF	Manual Control of R Gain
	Up	8x 01 04 03 02 FF	
	Down	8x 01 04 03 03 FF	
	Direct	8x 01 04 43 00 00 0p 0q FF	pq: R Gain
CAM_Bgain	Reset	8x 01 04 04 00 FF	Manual Control of B Gain
	Up	8x 01 04 04 02 FF	
	Down	8x 01 04 04 03 FF	
	Direct	8x 01 04 44 00 00 0p 0q FF	pq: B Gain
CAM_AE	Full Auto	8x 01 04 39 00 FF	Automatic Exposure mode
	Manual	8x 01 04 39 03 FF	Manual Control mode
	Shutter priority	8x 01 04 39 0A FF	Shutter Priority Automatic Exposure mode
	Iris priority	8x 01 04 39 0B FF	Iris Priority Automatic Exposure mode
	WDR	8x 01 04 39 21 FF	WDR mode
	Low Light	8x 01 04 39 22 FF	Low Light mode
CAM_Shutter	Reset	8x 01 04 0A 00 FF	Shutter Setting
	Up	8x 01 04 0A 02 FF	
	Down	8x 01 04 0A 03 FF	
	Direct	8x 01 04 4A 00 00 0p 0q FF	pq: Shutter Position
CAM_Iris	Reset	8x 01 04 0B 00 FF	Iris Setting
	Up	8x 01 04 0B 02 FF	
	Down	8x 01 04 0B 03 FF	
	Direct	8x 01 04 4B 00 00 0p 0q FF	pq: Iris Position
CAM_WDRStrength	Reset	8x 01 04 21 00 FF	WDR Level Setting
	Up	8x 01 04 21 02 FF	
	Down	8x 01 04 21 03 FF	
	Direct	8x 01 04 51 00 00 0p 0q FF	pq: WDR Level Positon
CAM_LowLightLevel	Reset	8x 01 04 22 00 FF	Low Light Setting
	Up	8x 01 04 22 02 FF	
	Down	8x 01 04 22 03 FF	
	Direct	8x 01 04 52 00 00 0p 0q FF	pq: Low Light Position
CAM_ExpComp	On	8x 01 04 3E 02 FF	Exposure Compensation ON/OFF
	Off	8x 01 04 3E 03 FF	
	Reset	8x 01 04 0E 00 FF	Exposure Compensation Amount Setting
	Up	8x 01 04 0E 02 FF	
	Down	8x 01 04 0E 03 FF	
	Direct	8x 01 04 4E 00 00 0p 0q FF	pq: ExpComp Position
CAM_BackLight	On	8x 01 04 33 02 FF	Back Light Compensation ON/OFF
	Off	8x 01 04 33 03 FF	
CAM_NR(2D)	-	8x 01 04 53 0p FF	p: NR Setting (0: OFF, level 1 to 5)
CAM_NR(3D)	-	8x 01 04 54 0p FF	p: NR Setting (0: OFF, level 1 to 5)

Command	Function	Command Packet	Note
CAM_Flicker	-	8x 01 04 23 0p FF	p: Flicker Settings(0: OFF, 1: 50Hz, 2: 60Hz)
CAM_Aperture	Reset	8x 01 04 02 00 FF	Aperture Control
	Up	8x 01 04 02 02 FF	
	Down	8x 01 04 02 03 FF	
	Direct	8x 01 04 42 00 00 0p 0q FF	pq: Aperture Gain
CAM_Memory	Reset	8x 01 04 3F 00 0p FF	p: Memory Number(=0 to 9) Corresponds to 0 to 9 on the Remote Commander.(Different with EVI-HD1)
	Set	8x 01 04 3F 01 0p FF	
	Recall	8x 01 04 3F 02 0p FF	
CAM_LR_Reverse	On	8x 01 04 61 02 FF	Image Flip Horizontal ON/OFF
	Off	8x 01 04 61 03 FF	
CAM_PictureFlip	On	8x 01 04 66 02 FF	Image Flip Vertical ON/OFF
	Off	8x 01 04 66 03 FF	
CAM_ColorGain	Diret	8x 01 04 49 00 00 00 0p FF	p: Color Gain setting 0h (60%) to Eh (200%)
CAM_ICR	ON	8x 01 04 01 02 FF	Infrared Mode ON/OFF
	OFF	8x 01 04 01 03 FF	
CAM_IDWrite		8x 01 04 22 0p 0q 0r 0s FF	pqrs: Camera ID (=0000 to FFFF)
IR_Receive	On	8x 01 06 08 02 FF	IR(remote commander)receive ON/OFF
	Off	8x 01 06 08 03 FF	
	On/Off	8x 01 06 08 10 FF	
IR_ReceiveReturn	On	8x 01 7D 01 03 00 00 FF	IR(remote commander)receive message via the VISCA communication ON/OFF
	Off	8x 01 7D 01 13 00 00 FF	
Pan_tiltDrive	Up	8x 01 06 01 VV WW 03 01 FF	VV: Pan speed 0x01 (low speed) to 0x18 (high speed) WW: Tilt speed 0x01 (low speed) to 0x14 (high speed) YYYY: Pan Position(TBD) ZZZZ: Tilt Position(TBD)
	Down	8x 01 06 01 VV WW 03 02 FF	
	Left	8x 01 06 01 VV WW 01 03 FF	
	Right	8x 01 06 01 VV WW 02 03 FF	
	Upleft	8x 01 06 01 VV WW 01 01 FF	
	Upright	8x 01 06 01 VV WW 02 01 FF	
	DownLeft	8x 01 06 01 VV WW 01 02 FF	
	DownRight	8x 01 06 01 VV WW 02 02 FF	
	Stop	8x 01 06 01 VV WW 03 03 FF	
	AbsolutePosition	8x 01 06 02 VV WW 0Y 0Y0Y0Y 0Z 0Z0Z0Z FF	
	RelativePosition	8x 01 06 03 VV WW 0Y 0Y0Y0Y 0Z 0Z0Z0Z FF	
	Home	8x 01 06 04 FF	
	Reset	8x 01 06 05 FF	
Pan_tiltLimitSet	LimitSet	8x 01 06 07 00 0W 0Y 0Y0Y0Y 0Z 0Z0Z0Z FF	W: 1 UpRight 0: DownLeft YYYY: Pan Limit Position ZZZZ: Tilt Position
	LimitClear	8x 01 06 07 01 0W 07 0F 0F0F 07 0F 0F0F FF	
CAM_AFSensitivity	High	8x 01 04 58 01 FF	AF Sensitivity High/Normal/Low
	Normal	8x 01 04 58 02 FF	
	Low	8x 01 04 58 03 FF	
CAM_SettingReset	Reset	8x 01 04 A0 10 FF	Reset Factory Setting
CAM_Iridix	Direct	8x 01 04 A7 00 00 0p 0q FF	pq: Iridix Position

Command	Function	Command Packet	Note
Color System	RGB	8x 01 04 A8 02 FF	Only valid in 720p60/1080p60
	YPbPr	8x 01 04 A8 03 FF	
CAM_AWBSensitivity	High	8x 01 04 A9 00 FF	High
	Normal	8x 01 04 A9 01 FF	Normal
	Low`	8x 01 04 A9 02 FF	Low
CAM_AFZone	Top	8x 01 04 AA 00 FF	AF Zone weight select
	Center	8x 01 04 AA 01 FF	
	Bottom	8x 01 04 AA 02 FF	
CAM_DVIMode	HDMI	8x 01 04 AB 02 FF	DVI output mode, default: HDMI
	DVI	8x 01 04 AB 03 FF	
CAM_ColorHue	Direct	8x 01 04 4F 00 00 00 0p FF	p: Color Hue setting 0h (− 7dgrees) to Eh (+7 degrees)
CAM_Gamma		8x 01 04 5B 0p FF	p: Gamma setting (0x00~0x0A)

Part3 Inquiry Command

Command	Command Packet	Return Packet	Note
CAM_PowerInq	8x 09 04 00 FF	y0 50 02 FF	On
		y0 50 03 FF	Off(Standby)
CAM_ZoomPosInq	8x 09 04 47 FF	y0 50 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_FocusAFModeInq	8x 09 04 38 FF	y0 50 02 FF	Auto Focus
		y0 50 03 FF	Manual Focus
CAM_FocusPosInq	8x 09 04 48 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Position
CAM_WBModeInq	8x 09 04 35 FF	y0 50 00 FF	Auto
		y0 50 01 FF	Indoor mode
		y0 50 02 FF	Outdoor mode
		y0 50 03 FF	OnePush mode
		y0 50 05 FF	Manual
		y0 50 2p FF	p:Color Temperature
CAM_RGainInq	8x 09 04 43 FF	y0 50 00 00 0p 0q FF	pq: R Gain
CAM_BGainInq	8x 09 04 44 FF	y0 50 00 00 0p 0q FF	pq: B Gain
CAM_AEModeInq	8x 09 04 39 FF	y0 50 00 FF	Full Auto
		y0 50 03 FF	Manual
		y0 50 0A FF	Shutter priority
		y0 50 0B FF	Iris priority
		y0 50 21 FF	WDR
		y0 50 22 FF	Low Light
CAM_ShutterPosInq	8x 09 04 4A FF	y0 50 00 00 0p 0q FF	pq: Shutter Position
CAM_IrisPosInq	8x 09 04 4B FF	y0 50 00 00 0p 0q FF	pq: Iris Position
CAM_WDRStrengthInq	8x 09 04 B1 FF	y0 50 00 00 0p 0q FF	pq: WDR Strength
CAM_LowLightLevInq	8x 09 04 B2 FF	y0 50 00 00 0p 0q FF	pq: Low Light Level
CAM_ExpCompModeInq	8x 09 04 3E FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ExpCompPosInq	8x 09 04 4E FF	y0 50 00 00 0p 0q FF	pq: ExpComp Position
CAM_BacklightModeInq	8x 09 04 33 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_Noise2DModeInq	8x 09 04 53 FF	y0 50 0p FF	Noise Reduction (2D) p: 0 to 5
CAM_Noise3DModeInq	8x 09 04 54 FF	y0 50 0p FF	Noise Reduction (3D) p: 0 to 5
CAM_FlickerModeInq	8x 09 04 55 FF	y0 50 0p FF	p: Flicker Settings(0: OFF, 1: 50Hz, 2: 60Hz)
CAM_ApertureInq	8x 09 04 42 FF	y0 50 00 00 0p 0q FF	pq: Aperture Gain
CAM_MemoryInq	8x 09 04 3F FF	y0 50 0p FF	p: Memory number last operated.
SYS_MenuModeInq	8x 09 06 06 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_LR_ReverseInq	8x 09 04 61 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_PictureFlipInq	8x 09 04 66 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_IDInq	8x 09 04 22 FF	y0 50 0p 0q 0r 0s FF	pqrs: Camera ID

CAM_VersionInq	8x 09 00 02 FF	y0 50 ab cd mnpqrstuvw FF	ab: Factory Code(08: VHD) cd: Hardware Version mnpq: ARM Version rstu: FPGA Version vw: Socket Number
VideoSystemInq	8x 09 06 23 FF	y0 50 00 FF	1920x1080i60
		y0 50 01 FF	1920x1080p30
		y0 50 02 FF	1280x720p60
		y0 50 03 FF	1280x720p30
		y0 50 07 FF	1920x1080p60
		y0 50 08 FF	1920x1080i50
		y0 50 09 FF	1920x1080p25
		y0 50 0A FF	1280x720p50
		y0 50 0B FF	1280x720p25
		y0 50 0F FF	1920x1080p50
IR_Receive	8x 09 06 08 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
IR_ReceiveReturn		y0 07 7D 01 04 00 FF	Power ON/OFF
		y0 07 7D 01 04 07 FF	Zoom tele/wide
		y0 07 7D 01 04 38 FF	AF On/Off
		y0 07 7D 01 04 33 FF	CAM_Backlight
		y0 07 7D 01 04 3F FF	CAM_Memory
		y0 07 7D 01 06 01 FF	Pan_tiltDrive
Pan-tiltMaxSpeedInq	8x 09 06 11 FF	y0 50 wwzz FF	ww: Pan Max Speed zz: Tilt Max Speed
Pan-tiltPosInq	8x 09 06 12 FF	y0 50 0w 0w0w0w 0z 0z0z0z FF	wwww: Pan Position zzzz: Tilt Position
CAM_AFSensitivityInq	8x 09 04 58 FF	y0 50 01 FF	High
		y0 50 02 FF	Normal
		y0 50 03 FF	Low
CAM_IridixInq	8x 09 04 A7 FF	y0 50 00 00 0p 0q FF	pq: Iridix Position
Color System Inq	8x 09 04 A8 FF	y0 50 02 FF	VGA Mode On
		y0 50 03 FF	VGA Mode Off
CAM_GammaInq	8x 09 04 5B FF	y0 50 0p FF	p: Gamma setting (0x00~0x0A)
CAM_AFZone	8x 09 04 AA FF	y0 50 00 FF	Top
		y0 50 01 FF	Center
		y0 50 02 FF	Bottom
CAM_DVIModeInq	8x 09 04 AB FF	y0 50 02 FF	DVI Mode:HDMI
		y0 50 03 FF	DVI Mode:DVI
CAM_ColorHueInq	8x 09 04 4F FF	y0 50 00 00 00 0p FF	p: Color Hue setting 0h (− 7dgrees) to Eh (+7 degrees)
CAM_AWBSensitivityInq	8x 09 04 A9 FF	y0 50 00 FF	High
		y0 50 01 FF	Normal
		y0 50 02 FF	Low

Part4 Customizing Control Command

Command	Function	Command Packet	Note
CAM_Power	On	8x 02 16 16 16 65 FF	Custom Power ON/OFF
	OFF(Standby)	8x 02 16 16 16 56 FF	
TCL_Power	TCL Standby	8x 01 02 75 75 01 04 FF	Forwarding AD DA 02 B0 01 04 AF FA
	TCL Wakeup	8x 01 02 75 75 00 03 FF	Forwarding AD DA 02 B0 00 03 AF FA

Part5 Customizing Inquiry Command

Command	Command Packet	Return Packet	Note
CAM_StatusInq	8x 02 20 01 01 FF	y0 50 0p 00 0q rs 0t 0u FF	p:Error code q:License rs:Video format t:Flip mode u:Running status

Note : 【x】 means the camera address you want to control , 【y】=【x + 8】

Pelco-D Protocol

Function	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
Up	0xFF	Address	0x00	0x08	Pan Speed	Tilt Speed	SUM
Down	0xFF	Address	0x00	0x10	Pan Speed	Tilt Speed	SUM
Left	0xFF	Address	0x00	0x04	Pan Speed	Tilt Speed	SUM
Right	0xFF	Address	0x00	0x02	Pan Speed	Tilt Speed	SUM
Zoom In	0xFF	Address	0x00	0x20	0x00	0x00	SUM
Zoom Out	0xFF	Address	0x00	0x40	0x00	0x00	SUM
Focus Far	0xFF	Address	0x00	0x80	0x00	0x00	SUM
Focus Near	0xFF	Address	0x01	0x00	0x00	0x00	SUM
Set Preset	0xFF	Address	0x00	0x03	0x00	Preset ID	SUM
Clear Preset	0xFF	Address	0x00	0x05	0x00	Preset ID	SUM
Call Preset	0xFF	Address	0x00	0x07	0x00	Preset ID	SUM
Auto Focus	0xFF	Address	0x00	0x2B	0x00	0x01	SUM
Manual Focus	0xFF	Address	0x00	0x2B	0x00	0x02	SUM
Query Pan Position	0xFF	Address	0x00	0x51	0x00	0x00	SUM
Query Pan Position Response	0xFF	Address	0x00	0x59	Value High Byte	Value Low Byte	SUM
Query Tilt Position	0xFF	Address	0x00	0x53	0x00	0x00	SUM
Query Tilt Position Response	0xFF	Address	0x00	0x5B	Value High Byte	Value Low Byte	SUM
Query Zoom Position	0xFF	Address	0x00	0x55	0x00	0x00	SUM
Query Zoom Position Response	0xFF	Address	0x00	0x5D	Value High Byte	Value Low Byte	SUM

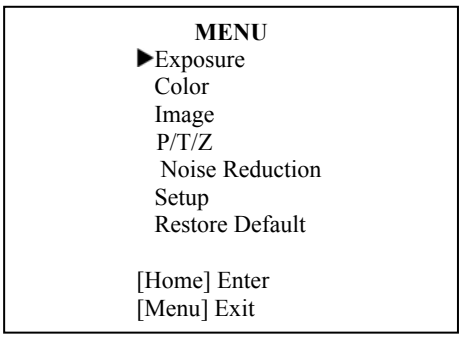
Pelco-P Protocol

Function	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Up	0xA0	Address	0x00	0x08	Pan Speed	Tilt Speed	0xAF	XOR
Down	0xA0	Address	0x00	0x10	Pan Speed	Tilt Speed	0xAF	XOR
Left	0xA0	Address	0x00	0x04	Pan Speed	Tilt Speed	0xAF	XOR
Right	0xA0	Address	0x00	0x02	Pan Speed	Tilt Speed	0xAF	XOR
Zoom In	0xA0	Address	0x00	0x20	0x00	0x00	0xAF	XOR
Zoom Out	0xA0	Address	0x00	0x40	0x00	0x00	0xAF	XOR
Focus Far	0xA0	Address	0x00	0x80	0x00	0x00	0xAF	XOR
Focus Near	0xA0	Address	0x01	0x00	0x00	0x00	0xAF	XOR
Set Preset	0xA0	Address	0x00	0x03	0x00	Preset ID	0xAF	XOR
Clear Preset	0xA0	Address	0x00	0x05	0x00	Preset ID	0xAF	XOR
Call Preset	0xA0	Address	0x00	0x07	0x00	Preset ID	0xAF	XOR
Auto Focus	0xA0	Address	0x00	0x2B	0x00	0x01	0xAF	XOR
Manual Focus	0xA0	Address	0x00	0x2B	0x00	0x02	0xAF	XOR
Query Pan Position	0xA0	Address	0x00	0x51	0x00	0x00	0xAF	XOR
Query Pan Position Response	0xA0	Address	0x00	0x59	Value High Byte	Value Low Byte	0xAF	XOR
Query Tilt Position	0xA0	Address	0x00	0x53	0x00	0x00	0xAF	XOR
Query Tilt Position Response	0xA0	Address	0x00	0x5B	Value High Byte	Value Low Byte	0xAF	XOR
Query Zoom Position	0xA0	Address	0x00	0x55	0x00	0x00	0xAF	XOR
Query Zoom Position Response	0xA0	Address	0x00	0x5D	Value High Byte	Value Low Byte	0xAF	XOR

Menu Setting

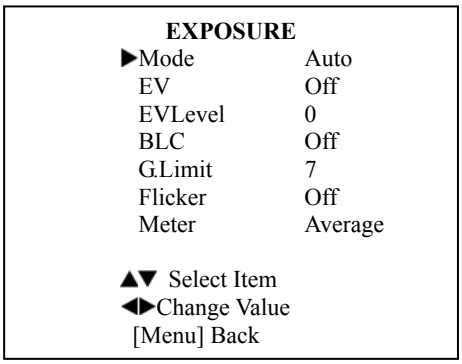
1. Main Menu

In normal image condition, press “MENU” key to display the menu, using scroll arrow to point at or highlight the selected items.



2. EXPOSURE

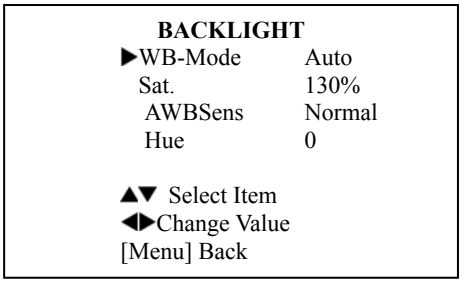
Choose and enter the EXPOSURE item (by using “HOME” key)



Mode: Exposure Mode, options available: Auto, Manual, AAE, SAE, Bright and WDR
EV: Exposure Value: Off, On
EVLevel: Exposure compensation levels: -7~+7
BLC: Back Light Compensation: Off, On
G Limit: Biggest gain limit: 0~ +F
Flicker: Anti-Flicker: Off, 50Hz, 60Hz
Iris: Iris value, we have F1.8, F2.0, F2.4, F2.8, F3.4, F4.0, F4.8, F5.6, F6.8, F8.0, F9.6, and F11.0 for options（only available in the mode of Manual and AAE）
Shut: Shutter value: 1/30, 1/60, 1/90, 1/100, 1/125, 1/180, 1/250, 1/350, 1/500, 1/725, 1/1000, 1/1500, 1/2000, 1/3000, 1/4000, 1/6000, 1/10000（only available in the mode of Manual and SAE）
Stren: WDR strength: 0~6（only available in the mode of WDR）
Meter : meter model , Average , Center optional .
Bright:: adjust the brightness, 00~23

3. COLOR

Choose and enter the COLOR item (by using HOME key)

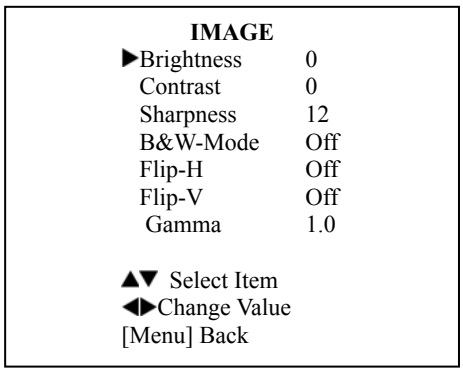


WB-Mode: White balance mode: Auto, Indoor, Outdoor, OnePush , Manual
RG: Red Gain: 0~255（only available in the mode of Manual）
BG: Blue Gain: 0~255（only available in the mode of Manual）
Sat.: Saturation: 60% ~ 200%

AWBSens: Sensitivity of white balance. Low，Normal，High
Hue: Tonal values of auto white balance: -7~ +7

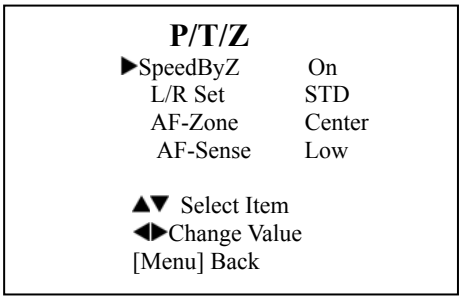
4. IMAGE

Choose and enter the Image item (by using “HOME” key)



Brightness: -5 ~ +5 value setting
Contrast: -5 ~ +5 value setting
Sharpness: 0 ~ 15 value setting
B&W-Mode: On, Off
Flip-H: Image Flip Horizontal: On, Off
Flip-V: Image Flip Vertical: On, Off
Gamma: 0.5~1.5 value setting

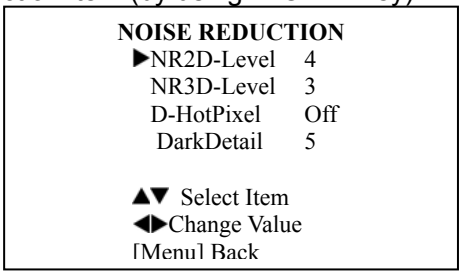
5.P/T/Z



SpeedByZ：On、Off
L/R Set：Remote Controller reversal setting , STD、REV for setting（when set REV，control left and right reversal）
AF-Zone:Focus on the interested zone,Center，Bottom and Top for options.
AF-Sense：Sensitivity of auto focus ,Low, Normal and High for options.

6. NOISE REDUCTION

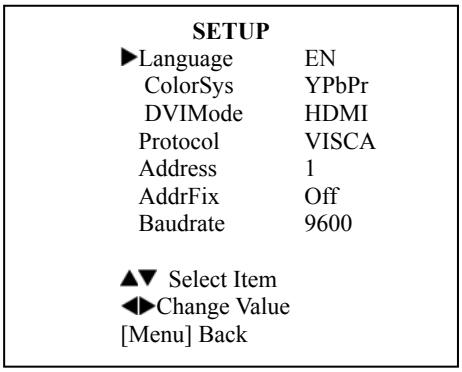
Choose and enter the Noise Reduction item (by using “HOME” key)



NR2D-Level: 2D Noise Reduction: Off, 1 ~ 5
NR2D-Level: 3D Noise Reduction: Off, 1 ~ 5
D-HotPixel：Off、Auto、1 ~ 5
DarkDetail：0~15
Note: The higher the noise reduction level, the less image detail.

7. SETUP

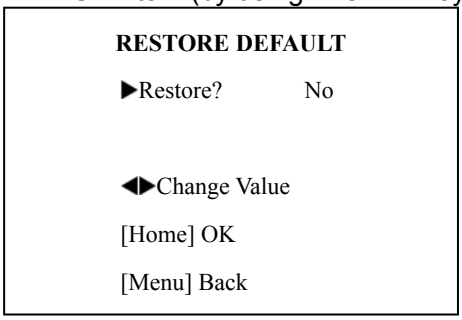
Choose and enter the Setup item (by using “HOME” key)



Language：Manual Language ;EN、Chinese
ColorSys：Set the color system in the DVI analog signal, YPbPr，RGB（only under 720p60/1080p60 valid ）for settings.
DVIMode：Set the signal output mode of the DVI digital signal HDMI、DVI（undrer restart valid）for settings
Protocol：VISCA, P-D, P-P
Address：Set address to the protocol .In VISCA,1~7 ； In P-D and P-P：0~15
AddrFix：On，Off（when set On，can not change camera address through Com)
Baudrate：2400、4800、9600

8. RESTORE DEFAULT

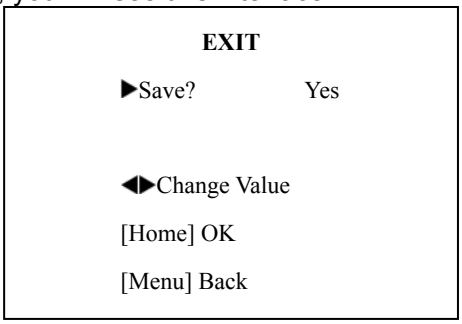
Choose and enter the RESTORE DEFAULT item (by using “HOME” key)



Restore：Yes、No。Press “HOME” key 3 seconds to restore。
Note:
Restore will recover all parameters,including remote controller address and COM address.

9.EXIT

Enter the “MENU” key once again, you will see this interface.



Save: Yes or No for options.
Note: You need to press the “HOME” key to confirm.